# Best Practices for Teaching via Interactive Video Conferencing Technology: A Review of the Literature

Name will be added later



**Abstract: This review summarizes research-based and anecdotal distance education literature from 2000 – 2008 and attempts to isolate best practices for remote teaching via Interactive Video Conferencing (IVC). Anecdotal literature, culled primarily from Internet websites, blogs, and listservs provides practical, hands-on methodologies for educators new to teaching via IVC. Peer-reviewed, research-based literature provides a theoretical framework for grounding one's IVC practice in sound, pedagogic theory. The primary focus of this review is to understand how emerging Web 2.0 technologies such as blogs, wikis, and social networking sites might be implemented into the IVC classroom to enhance student/student, student/instructor, and student/content interaction and engagement.**

The purpose of this literature review is to determine a best practices approach for educators teaching via interactive video conferencing technology (IVC). IVC is live, two-way, interactive instruction where learners in different geographic locations engage in face-to-face audio and visual exchanges with one another and their instructor using remote cameras, monitors, and document software. Hybrid instructional methods that have applicability across both IVC and web-based distance education (DE) are the primary focus of this review.

In a field where technological advances and innovations transpire almost overnight, identifying and isolating a best practices approach can be difficult. In fact, Goldman (2004) cautions against trying to do so. He argues that solidifying best practices in DE reifies the rigidity of the traditional classroom. Similarly, Spector and de la Teja (2001) suggest that DE competencies are as fluid and dynamic as emerging technologies, are difficult to pinpoint, and are largely dependent upon "relevant social contexts" (p. 3). The trend as evidenced in the literature appears to be a move away from the *how-to's* of DE and more toward the *why's* of distance practice (Smyth, 2005; McCurry, 2003). Interestingly, many of the methodologies cited in this review were located on personal and professional blogs, websites, and listservs on the Internet. It appears that the best approach for educators seeking a best practices model is to keep in mind that educational practices, like technologies, are ever evolving and fluid and should be adjusted to address the needs of the learner, fit the context of the learning, and achieve desired outcomes. In the best sense of the term, best practices for distance education instruction should strive for pedagogic excellence (Duderstadt, 2007**)** Such excellence entails grounding one's practice in theory, knowing oneself as an educator, knowing one's learners, and understanding and using technology to enhance one's practice.

## Theory

It seems redundant to suggest that grounding one's instructional practice in theory is simply good practice. However, as recently as 2007, Moore critiqued the current state of distance education research as favoring popular "atheoretical terminology" (57) over sound learning theory. This quasi-research, argues Moore, does little in way of contributing to larger, wider frames of knowledge and results not only in confusion, but in poor productivity and poor quality research.

Historically, most theoretical approaches to DE have been based on a social-constructivist model of learning (Twigg, 2001; Garrett, 2006). From a constructivist standpoint, learning does not take place in a vacuum, but is situated in social relationships and within political, historical contexts.

Of late, there has been movement toward expanding the constructivist approach to distance learning. For example, McCurry (2003) supports a meta-theoretical approach centered on critical pedagogy, communicative theory, and social-interaction theory while Putnam and Borko (2000) propose a "situative" (p. 5) theoretical approach. Taking a slightly different tack, Knight, Dixon, Norton and Bentley (2004) frame their research from a multicultural feminist critical lens that implicates the culturally restrictive nature of distance instruction, IVC in particular. Others, such as Moore (2007), situate the pedagogical theory of transactional distance (discourse) within the broader framework of Peters' (as cited in Moore) management or "industrial" (p. 56) theory. Peters' theory conceptualizes the distinction between those who facilitate DE and those who design it. Lastly, Harwood and Asal

(2007) posit that a constructivist approach to DE is much too passive. Instead, they call for a more agentive "user heuristic" (p. 16) model to explain how students and faculty interact with technology and with each other.

**Knowing One's Learners**



An ever-expanding body of literature is addressing the wonderful, perplexing, intimidating, and inspiring generation of students who have never known life without technology. Hard-wired and plugged in 24/7, this "Digital Generation" (Harwood & Asal, 2007) cares deeply about their learning. This new generation of learners (Gen-Xers, Millenials, Echo Boomers) arrive in our classrooms feeling protected, special, indifferent, ambitious, eager to please, stressed out, politically conservative, team oriented, focused on performance and grades, and unable to think long-range (Newton, 2000). What these 21st century learners seeks from their education are relevant learning experiences that will provide them with life skills that will transcend their classrooms (Oblinger, 2008; Pape, 2005; Dede, L'Bahy, & Whitehouse, 2002). Unfortunately, recent studies indicate that today's educators have not kept pace with the technologies or the pedagogies required for that transcendence—a fact that the Digital Generation is woefully aware of. These students may be praying that their parents don't catch on to new technologies (Bloom, 2008; Prensky, 2004) but they are just as assuredly praying that their instructors will.

**Knowing Oneself as an Educator**

Awareness that technology-mediated instruction is not without its challenge must certainly be considered a best practice. It is well documented that face-to-face (F2F) instructional methods cannot simply be migrated to distance instruction (Twigg, 2001; Reynard, 2008); teaching via IVC requires significant changes to one's style teaching style and methods. The anecdotal literature is replete with narratives from stunned educators new to IVC instruction. Practically speaking, time (both to prepare and teach) was cited as the most challenging adjustment to remote teaching. Other adjustments to classroom practice included 1) the need for release time to visit and teach from far-end sites, 2) methods to increase student engagement and collaboration, 3) strategies for classroom management, 4) responses to cheating, 5) guidance for collaborating with on/off site facilitators, coordinators, and administrators, 6) ongoing professional development, and 7) technology proficiency.

Surprisingly, fear of technology ranked lower than expected as a major hurdle faced by faculty new to distance instruction. Factors that may account for this lack of technophobia include differences in generation, gender and tenure.

A growing body of literature suggests that pre-service and novice educators, members of the Digital Generation themselves, are quite adept and comfortable with technology in the classroom and given proper support and training become excellent distance education instructors (Harwood and Asal, 2007; Dede et al., 2002). However, a word of caution: In practicum, pre-service professionals, regardless of their own comfort level and skill with technology, will model the technology use (or non-use) of their supervising teachers (Kelty, 2000).

Gender also appears to affect success with distance instruction, though there is some contradiction in the research. One study found that female faculty, regardless of age, self-identify as "risk takers or techies" (Armstrong, 2008) and were quite willing to implement and use technology in their classrooms given proper training and incentives. Conversely, Kelty (2002) reported that female faculty were not only less experienced and less interested in technology than their male colleagues, but were intimated by their "college bound, mostly male" (p. 4) students seeking higher levels of technology instruction.

While tenure and content-expertise have been shown to alleviate much of the fear of teaching via technology (Twigg, 2001), Kelty's (2002) research found that veterans are the worst in terms of resisting the addition of technology into their curriculums. IT trainers should note Harwood and Asal's (2007) assertion that veteran educators who consider their classrooms technology-free are more likely to take advantage of professional development than educators from the Digital Generation.

In addition to the practical challenges of IVC teaching, attention must also be paid to the affective or emotional upheavals that come when teaching at a distance. For veteran educators, the affective jolt of DE is most unsettling. Studying university faculty, Collins (2000) noted that experienced faculty transitioning to DE reported intense feelings of inadequacy, fraudulence, uncertainty, and exhaustion.

The literature suggests that instructors who successfully go on to become capable and skilled practitioners of DE possess not only context expertise and technological skills, but also posses certain emotional and

psychological traits that help ease their transition into the remote classroom. Characteristics (Goldman, 2004; Kelty 2001; Collins, 2000) that emerged from the literature were:

- an ability to embrace a certain level of ambiguity
- the willingness to develop new methods and adopt counterintuitive pedagogies
- an openness to learning
- the ability to quiet one's inner critic
- enthusiasm for non-traditional instructional methods



Another key trait of a successful DE instructor is a willingness to adopt a *bottom up* (Garrett, 2006; Harwood & Asal, 2007) pedagogy. Teaching from the bottom up requires one to relinquish the top-down, hierarchal instructional methods that so often define traditional classrooms. In distance education, the term teacher, with its implicit message of all-knowing disseminator of knowledge is giving way to terms such as *facilitator*, *tutor*, or *partner* (Collis and Moonen as cited in Beldarrain, 2006; Darabai, Sikorski, and Harvey, 2006). From this new linguistic, pedagogic and espistemological model (Smyth, 2005), students and instructors work together to co-create new bodies knowledge, to validate the lived experience of learners, to challenge accepted forms of knowledge, and to explore relations of power and reciprocity. While it may seem counterintuitive to relinquish one's role as "Sage on the Stage", the DE literature overwhelmingly supports this strategic pedagogic move (Goldman, 2004; Tallent-Runnels, Thomas, Lan, Cooper, Ahern, Shaw et al., 2006).

Enhancing Practice through Emerging Technologies

Since the inception of DE instruction, the idea that technology should be transparent in relation to instruction has prevailed. That is, the focus in the technology-mediated classroom should remain on the learning taking place, not the razzle and dazzle of the newest technology (Tripp, 2001; Willis and Lockee, 2008; Smyth, 2005). Recent research however challenges this notion of technology transparency. For example, Lankshear and Snyder (2000) propose that technologies become active agents or partners in the DE classroom. From this perspective, technologies are considered not as an add-on or distraction, but as an "active participant" (p. 113) in the distance classroom. Goldman (2004) argues convincingly that technology can be more than a vehicle for teaching course-specific content. Using digital media technology, Goldman found that when learners and teachers used technology to "think about their thinking" (p. 164) as a learning community, the culture of the classroom transformed into a more equitable space for "gender, race, cultural, and age differences" (p. 164). Similarly, McCurry (2003) posits that technology becomes truly transformative when it is driven by democratic ideals which favor "personal and social-problem solving, historical perspectives, understanding power relationships, justice and equality, and cultural and human aesthetics" (p. 430).

Lankshear and Snyder (2000) note that today's learners have "great enthusiasm for and enjoyment in learning . . . around a range of new technologies" (p. 101). Duderstadt (2007) concurs. He aptly observes that to resist technology in the classroom is futile, as today's learners have "brought it with them" (p. 235). Clearly, approaching technology from this vantage point may require a huge paradigm shift, but it is a shift that more closely aligns with the lived experienced of today's Net Generation.

**Emerging Technologies**

According to Dede (2004), the goal of every distance education class should be engagement. In the remote learning environment, this is no small task. The timely discussion of interaction patterns in the videoconferenced learning environment proves particularly useful (Saw et al., 2008). Studying the three predominant types of interactions in IVC instruction (student/student, student/instructor, and student/content), the Saw et al. team discovered that student/student interaction is almost *non-existent*. Understanding that feelings of psychological distance are exacerbated by the physical distance in the remote classroom, the question then becomes, "How can technology be used to transform the remote learning environment from a place of isolation and disconnection to one of engagement and connection?"

To date, the IVC literature is somewhat lacking. The Saw et al. (2008) study demonstrated that well-designed graphics significantly enhanced student/instructor interaction, but contributed little to engagement among peers. With such limited research, one alternative for IVC educator's wishing to increase student/student engagement may be to implement Web 2.0 technologies into their classrooms, particularly computer-mediated communication technologies (CMC).

CMC technologies include electronic discussion boards, blogs, wikis, Instant Message/IM, and social networking sites such as Second Life. Limited research suggests CMC "contribution pedagogies" (Collis and Moonen as cited in Beldarrain, 2006) technologies can be successfully introduced into hybrid IVC classrooms

(Mupinga, 2005) to facilitate collaboration and cooperation (Manca and Delfino, 2007), increase critical reflection and student engagement (Dede, L'Bahy and Whitehouse, 2002), improve cognition (Mykota and Duncan, 2007; Beldarrian, 2006), promote relationships of reciprocity (Collins, 2000) and move traditional instruction from "independent learning to collective knowing" (McDuffie and Slavit, 2003, p. 6).

A primary concern with CMC is the issue of lurking. Romiszowski and Mason (n.d., p.424) point out that students in a face-to-face environment lurk "most of the time" (p. 399) with only occasional participation. Lurking in the CMC environment is no different. In fact, these authors point out that lurking can be a useful mechanism of authentic learning as students observe their peers engaged in active dialogue. And in another context, Vandrick (2000) calls for a widening of the definition of *participation* to include culturally appropriate behaviors that Western educators would negatively consider as non-participatory, or lurking.



**Electronic Discussion Boards**

In addition to extending F2F discussion, one of the best rationales for including threaded discussions into one's distance instruction is that it provides a safe forum for students to participant who might otherwise remain silent. McDuffie and Slavit (2003) observed that quieter students were recognized and given "prestige" (p. 10) when they were referenced in others' posts. Furthermore, students who typically contribute very little or not at all in the physical classroom have been shown to contribute significantly more in threaded discussions. By providing learners with time to reflect and respond to course material in a virtual forum that is meaningful to them, feelings of community are nurtured, self-efficacy is enhanced, and a safe learning environment is created.

**Blogs**

As an asynchronous means of instruction that supports greater social discourse (Dickey, 2004), blogging fosters the development of engaged learning communities while simultaneously reducing feelings of alienation and isolation in distance learners. Due to the "personal and self-revealing aspects of blogs" (p. 288) and student perceptions that blogs are more progressive and even a little "countercultural" (p. 280), Dickey found that students embrace blogs over more traditional discussion group tools (in this case, Blackboard) as a way to socialize, interact and enter into dialogue, elicit peer and instructor support, and express feelings and emotions.

Blogging supports Duderstadt's (2007) position that learning is much more peer-driven than in previous decades due in large part to technology. Through "sophisticated peer networks" (Duderstadt, 2007, p. 234), students are taking more and more control over their learning environment *and* their own learning. As a case in point, Garrett (2006), a professor in the School of Business at Eastern Illinois University, incorporates blogs into his distance courses to address "issue-oriented" (p. 2) topics. Blogging in Garrett's courses are free-form, but certainly not free-for-alls. Garrett provides learners with a content-focused topic where students post related opinions and/or positions as well as explicit instruction on issues of privacy, "net neutrality" (p. 2), copyright issues, and proper documentation of sources.

In the K-12 classroom, Dlott (2007) combines podcasting and blogging technologies as motivational learning tools to enhance learning and increase motivation. Dlott reports that blogs provide an authentic and "global" (p. 4) audience for young writers, and that the public nature and visibility of a blog is highly motivating. Altough current research on blogs in DE has focused primarily on web-based learning environments, the technology suggests easy transferability to the IVC classroom for students to blog across sites. More IVC-specific research is needed.

**Podcasting**

Another form of digital media becoming popular with distance educators is podcasting. A podcast is a digital broadcast that is downloaded and accessed through a computer or MP3 player. Griffey (2007) suggests three key concepts for implementing podcasts: creating the content, distributing the podcasts, and aggregating and synching to iPods locally (p. 1). Rationales for podcast are many. They include (a) teaching to multiple learning styles, (b) allowing for intensive review and skills reinforcement, (c) focusing on curriculum, (d) promoting 21st-century skills, (e) integrating into F2F instruction easily, (f) providing learners with smaller, more digestible chunks of information, and (g) providing content on-demand.

Reynard (2008) calls for more a more innovative use of podcasts in the distance classroom. Podcasting, according to Reynard, should challenge "conventional notions" (p. 3) of knowledge construction and promote new levels of peer networking and input. Supported by Dlott (2007), Reynard argues that progressive instructors should move beyond the obvious uses of podcasts and take full advantage of the technology's "public nature" (p. 1) to

create collaborative, contribution-oriented communities of highly engaged learners. Innovative podcast use should represent a change in teaching methods and learning outcomes, reflect the essence and capability of the technology itself, and appeal to today's technically talented learners.

Not surprisingly, not all educators are sold on podcasting technology. In *Attack of the Pod People,* Schneider (2006) offers a dissenting view in "support of real-time, non-virtual class sessions" (p. 1). For Schneider, the F2F classroom experience becomes diluted, lacking conviction and style, when instruction is delivered through an iPod broadcast. Instruction through digital media is reduced to "a thin imitation for real instruction" and "degenerates into mere utterance" (p. 3) rather than meaningful, value-laden instruction. Physical presence or showing up in the physical not only indicates one's commitment for the subject matter and one's commitment to learning, but for Schneider is arguably the only way to transmit "the values that make information worth having" (p.3). Schneider's anti-iPod stance echoes a long-held notion in the academy—that technology will be the ultimate demise of the academic.



**Wikis**

There is often the misperception that Wikis are repositories of distortion, delusion and downright misinformation, and to some extent this is true. When properly monitored, however, Wiki technology as a "do-it-yourself approach to knowledge creation" (Oblinger, 2008, p. 15) becomes another tool for the forward-thinking distance instructor to promote collaboration and co-creation of knowledge through methods that the Digital Generation truly care about. Dlott (2007) writes, "Young adults increasingly not only read online but also test out their writing voices online" (p. 2). Wikis provide an authentic audience for student voices. Garrett (2007) incorporates wikis as a space for the collaborative development of course content.

**Instant Messaging / IM**

It should come as no surprise that Instant Messaging (IM) is making its way into the distance classroom. As evidenced in the study by Nicholson (2000), students are clearly aware that IM technology is not the best tool for learning content. Rather, tech-savvy learners use IM to build rapport between student/student and student/teacher (Nicholson, 2002, p. 7). Harwood and Asal (2007) suggest that IM serves primarily as a means to "maintain and forge new social networks" (p. 42) and functions much the same way as a brief chat in the hallway or after class with ones' classmates IM can be used to say hello, ask a quick question, or check on an assignment. Jolivette (2006) posits that IM, as a relationally-bound technology, is ideal for creating and maintaining relationships in the classroom. In the F2F classroom, relationships are often taken for granted or "merely assumed" (Jolivette, 2006, p. 536), but in the distance learning environment where social cues such as eye contact, body language and physical proximity are obscured, IM may prove invaluable.

**Virtual Worlds**

Perhaps one of the most counterintuitive methods to develop a culture a collaboration, interaction, creativity, and community among students is to send them into 3-D virtual worlds *peopled* by avatars. But instructors familiar with student achievement in augmented realities have high praise for the medium as a way to promote real-world problem solving and high order thinking skills required for 21st century literacy (Perkins and Arreguin, 2007). Additionally, student motivation is a clear benefit of learning through virtual communities. Oblinger (2008) writes, "There is a significant difference between learning *about* physics and learning to *be a physicist"* (p. 21). Likewise, Sheey (as cited in Perkins and Arreguin, 2008) reports that her middle-school students have taken real ownership of the course material through the virtual world, *Second Life*. Noteworthy is Sheey's action research with her students with disabilities. Once disengaged with the curriculum, Sheey has discovered that for these students, learning in a virtual world "helps focus their attention and [leads] to better retention and attention" (p. 18).

Learning in virtual spaces has raised concerns about safety, and justifiably so. In addition to traditional concerns with copyright and fair use online usage, there is now a very real concern for the psychological and physical safety of students who participate in virtual learning environments. Recently, Bugeja (2008) reported on an online shooting incident that occurred in a *Second Life* virtual campus after the Virginia Tech shootings. Bugeja noted that the creators of *Second Life* (Linden Lab) openly acknowledged that "assault and harassment are the two most-common violations in its virtual world" (p. 3). According to Bugeja, the academe is so mesmerized "by the allure of technology" (p. 4) that they are completely blinded by the very real threat of legal action that Bugeja predicts "will occur" (p. 4).

While Bugeja (2008) raises important issues for consideration, other research indicated that the Digital Generation are, for the most part, well educated about the threats of online participation, as are their parents (Macgill, 2007). Educators, however, are leery. Richardson (2007) suggests that 21st century educators must *unlearn* outdated ideologies and myths about online and distance learning, namely that putting themselves and their students "out there" (p. 1) in cyberspace is a dangerous practice, particularly since we can do it in "safe and relevant ways" (p. 1). Richardson also questions the wisdom of blocking and filtering access to sites and experiences students might encounter online. Wouldn't literacy be better taught, he posits, by helping our students navigate and thinking critically about the information they encounter rather than prohibiting the information? Beldarrain (2006) supports this notion. He argues that while enhanced student interaction continues to be a top design priority in distance education, the emerging technologies that promote such interaction (e.g. blogs, wikis, podcasts) and are considered to support both learning theory and learning outcomes are considered by many administrators as "unsafe practices" (p. 145), thus blocked or unauthorized for classroom use. In short, if the aim of educators is to teach and prepare students to live, participate, and thrive in the real world, then it is nothing short of irresponsible if their education fails to prepare them to participate safely and intelligently in the digitized world of the 21st century.



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